Space Weather Forecast

Issued on Friday, 09 August 2024 at 13:18 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate solar activity expected. Occasional Minor to moderate geomagnetic storms likely, mainly Days 2 and 3 (10 and 11 Aug).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: High solar activity with one Strong flare plus four Moderate class flares through the period There are nine sunspot regions on the visible disc, of which eight are numbered. All of the regions on the disc where either stable or showed very slight changes over the past 24 hours. Most are geomagnetically simple, although three regions are moderately complex.

A CME (Coronal mass ejection) associated with strong flare produced a complex halo which has been analysed to have an Earth directed component. This CME has the potential to arrive at Earth later Day 3 (11 Aug) though there is considerable uncertainty due to the challenging analysis.

Solar Wind / Geomagnetic Activity: Slow wind conditions mostly persisted through the period, although wind speeds did touch into slightly elevated levels at times. Interplanetary Magnetic Field was Weak while the north-south component was Weak and variable in direction. Geomagnetic activity was Quiet (Kp1-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate to High solar activity is forecast to continue, with occasional Moderate-class flares expected and a chance of isolated Strong-class flares.

Solar Wind /Geomagnetic Activity: There is potential for multiple CMEs (Coronal Mass Ejections) to arrive on Day 2 (10 Aug), but confidence remains low due to the complex halos produced by these CMEs and coinciding far side events, which complicate analysis. Additionally, a CME associated with the Strong flare at 08/1935UTC, which also produced a complex halo, has been analysed to have an Earth directed component and may arrive at Earth later Day 3 (11 Aug). Despite the uncertainty, it is likely there will be some CME influence through Day 2-3(10-11 Aug) though confidence in the forecast is low due to the challenging analysis.

Geomagnetic activity is expected to be mostly Quiet to unsettled (Kp1-3) initially, with a chance of isolated Unsettled intervals. From Day 2 (10 Aug) occasional G1 -G2/Minor to Moderate Storms periods are expected, with a slight chance of G3/Strong storms. Geomagnetic activity is then expected to decline back to mostly quiet to unsettled through Day 4 (12 Aug).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to persist around background levels, but with a chance of further enhancement given the occurrence of any notable flares. This gives a slight chance of reaching or exceeding the S1 Minor Radiation Storm level.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	70	70	20
Strong	G3	No	1	15	15	1
Severe	G4	No	1	5	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	80	80	80	80
Very Active	R3 to R5 X	Yes	20	20	20	20

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	20	20	20	20
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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